



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/799,388	03/12/2004	Igor Seleznev	0492611-0545/MIT9277CON2	7295
24280	7590	01/06/2010		
CHOATE, HALL & STEWART LLP TWO INTERNATIONAL PLACE BOSTON, MA 02110			EXAMINER WARTALOWICZ, PAUL A	
			ART UNIT	PAPER NUMBER
			1793	
			NOTIFICATION DATE	DELIVERY MODE
			01/06/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@choate.com

Office Action Summary	Application No. 10/799,388	Applicant(s) SELEZNEV ET AL.	
	Examiner PAUL A. WARTALOWICZ	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 40,42-47,49-62 and 85-89 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 40,42-47,49-62 and 85-89 is/are rejected.
- 7) ☒ Claim(s) 86-89 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 12/22/09 have been fully considered but they are not persuasive.

Applicant argues that at best, the total pressure is disclosed as being sub-atmospheric and that the lost count does not teach the total pressure to be less than about 8 Torr as recited in the claims.

However, lost count subject matter that is available as prior art under 35 U.S.C. 102 may be used alone or in combination with other references under 35 U.S.C. 103. MPEP 2138.01 (IV). The subject matter of the lost count is available as prior art under 35 USC 102(g). It appears that the total pressure limitations in claims 40 and 42-46 are obvious in view of the subject matter of lost count as follows: the subject matter of the lost count recites that the "presence of oxygen and water vapor at sub-atmospheric pressure" (see claim 143 of the lost count). It appears that the values of 1, 0.1, 0.01, and 0.001 Torr lie inside the range of sub-atmospheric pressure (i.e. less than 760 torr). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. MPEP 2144.05 (I).

Additionally, the limitation of a total pressure of less than about 8 Torr is rejected, in the alternative, over the lost count in view of Fritemeier as discussed in the rejection, *infra*.

Claim Objections

Art Unit: 1793

Claims 86-89 are objected to under 37 CFR 1.75 as being a substantial duplicate of claims 59-62, respectively. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 40, 42-47, 49-62, 85-89 are rejected under 35 U.S.C. 103(a) as being unpatentable over the sole lost count of Patent Interference No. 105,406 in view of Fritzemeier (US 6797313) and Smith (US 6172009).

The combination of the sole lost count and Rupich are generic to the subject matter of the sole lost count of Patent Interference No. 105,406, as to which a judgment

Art Unit: 1793

adverse to the applicant has been rendered. A losing party is barred on the merits from seeking a claim that would have been anticipated or rendered obvious by the subject matter of the lost count. *In re Deckler*, 977 F.2d 1449, 24 USPQ2d 1448 (Fed. Cir. 1992); *Ex parte Tytgat*, 225 USPQ 907 (Bd. Pat. App. & Inter. 1985). See also MPEP §2308.03.

The subject matter of the lost count sets forth heat-treating said precursor film (comprising barium, fluorine, yttrium, and copper) at a temperature above about 700°C in the presence of oxygen. One of ordinary skill in the art would recognize heat-treating would begin at room temperature and then rise to a temperature of above 700°C. As the temperature is increased to above 700°C, the precursor with oxygen present will be processed at a temperature of 400°C that will inherently form an oxyfluoride film wherein the temperature is subsequently raised to a temperature of above 700°C in order to convert the oxyfluoride precursor to the superconducting material. It is stated in the specification that this is believed to be the mechanism that occurs during treatment of the precursor with oxygen at elevated temperatures (2005/0014652 [0036] and 2004/0171494 [0035]). Therefore, the specification supports the assertion that the oxyfluoride precursor film is formed in the process of the subject matter of the lost count.

The subject matter of the lost count recites forming a film of crystalline $\text{YBa}_2\text{Cu}_3\text{O}_7$. The subject matter expressly states the ratio of the elements present in the superconducting material. One of ordinary skill in the art would recognize that it would

Art Unit: 1793

have been obvious to one of ordinary skill in the art to provide the elements in substantially stoichiometric amounts to produce the compound as claimed.

It appears that the specification describes the formation of the intermediate metal oxyfluoride compound as the mechanism by which the invention, and therefore the lost count, is carried out.

It is well known in the art to remove HF from the surface as recognized throughout the specification of the lost count. Specifically, HF is evolved through the process of heating at the temperature (700°C) in the atmosphere (presence of oxygen and water) set forth in the lost count. As HF is produced inherently in the subject matter of the lost count, one of ordinary skill in the art would recognize that the HF must be removed in order to produce high quality YBCO (paragraph 0055, 2005/0014652). Additionally, reduced HF content within the oxyfluoride film may favor c-axis texturing (paragraph 0058, 2005/0014652). Because the invention is directed to forming a crystalline YBCO at a low pressure, one of ordinary skill would recognize that it would at least be obvious to remove HF from the substrate in order to provide a high quality YBCO with the desired orientation. Additionally, the specification indicates that there are a number of ways to remove HF from the substrate surface including lowering the ambient pressure in the furnace. The subject matter of the lost count recites "heat-treating said precursor film at a temperature above 700°C in the presence of oxygen and water vapor at a sub-atmospheric pressure to form a crystalline structure" (emphasis added). Therefore, it is also maintained that HF is inherently removed at the

Art Unit: 1793

conditions required by the subject matter of the lost count (presence of oxygen and water vapor, reduced pressure, 700°C).

The lost count additionally teaches the processing gas of claim 47, the film thickness of claims 50 and 51, the substrate of claims 55-58, and the that the superconductor is YBCO (claim 54).

Regarding claim 40, the lost count fails to teach that the substrate is biaxial textured.

Fritzemeier, however, teaches a method of making YBCO superconductors (col. 2) wherein a metal substrate is biaxially textured for the purpose of providing a crystallographic orientation to the superconducting layer (col. 2, 20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to biaxially texture a metal substrate of the lost count in order to provide a crystallographic orientation to the superconducting layer (col. 2, 20) as taught by Fritzemeier.

Regarding claim 40, the sole count fails to teach the oriented oxide superconducting film exhibits c-axis texturing.

Fritzemeier, however, teaches a method of making YBCO superconductors (col. 1) wherein the superconductor film exhibits c-axis texturing (col. 3).

Smith teaches a method of making superconductors (col. 1) wherein the superconductor comprises c-axis epitaxy for the purpose of providing high J_c values (col. 5).

As Fritzemeier teaches a superconductor film exhibits c-axis texturing (col. 3) and Smith teaches that a superconductor comprises c-axis epitaxy for the purpose of providing high J_c values (col. 5), it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide the superconductor film of the lost count having c-axis epitaxy (texturing) in order to provide high J_c values.

Regarding claims 40 and 42-46, the subject matter of the lost count recites that the "presence of oxygen and water vapor at sub-atmospheric pressure" (see claim 143 of the lost count). It appears that the values of less than 8, 1, 0.1, 0.01, and 0.001 Torr lie inside the range of sub-atmospheric pressure (i.e. less than 760 torr). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. MPEP 2144.05 (I).

In the alternative, regarding claim 40, Fritzemeier teaches that the precursor film is heated in an atmosphere at a partial pressure of 5-50 Torr of water vapor and a partial pressure of 0.1-760 Torr of oxygen (col. 15, 16).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to heat the precursor film of the lost count in an atmosphere at a partial pressure of 5-50 Torr of water vapor and a partial pressure of 0.1-760 Torr (col. 15, 16) in order to produce a YBCO superconductor in a substantially similar process as taught by Fritzemeier.

It appears that the total pressure having a value of less than 8 Torr overlaps with the range of 5-50 Torr of water vapor and 0.1-760 Torr of oxygen. In the case where the

Art Unit: 1793

claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists. MPEP 2144.05 (I).

Regarding claims 59-62, 86-89 the subject matter of the sole count requires that the critical current density is about 0.1 MA/cm^2 or greater. It appears that range of greater than 0.45, 1, 2, 4 MA/cm^2 overlap with the range of the lost count, 0.1 MA/cm^2 or greater. In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists. MPEP 2144.05 (I).

Regarding claims 52-53, the subject matter of the lost count requires that the thickness of the film is at least 0.5 microns (see claim 159 of the lost count). It appears that the values of 0.8 and 1.0 microns lie inside of the range of at least 0.5 microns. In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists. MPEP 2144.05 (I).

Regarding claim 85, the lost count does not teach that a buffer layer deposited on the substrate before the superconducting layer is deposited.

However, Fritzemeier teaches a method of making YBCO superconductors (col. 1) wherein a buffer layer (cerium oxide, inter alia, col. 27) wherein a buffer layer is deposited on a substrate before depositing a YBCO superconductor for the purpose of preventing substrate elements from mitigating to the surface of the intermediate layers (col. 20, 21).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to deposit a buffer layer on a substrate before depositing a YBCO superconductor of the lost count in order to prevent substrate

Art Unit: 1793

elements from mitigating to the surface of the intermediate layers (col. 20, 21) as taught by Fritzemeier.

Regarding claims 59-62, 86-89, Fritzemeier teaches that parameters, such as superconductor thickness, are varied for the purpose of providing a critical current density of at least about $2 \times 10^6 \text{ A/cm}^2$ (col. 7).

Regarding claim 89 specifically, it appears that the prior art range of $2 \times 10^6 \text{ A/cm}^2$ overlaps with the claimed range of $0.45 \times 10^6 \text{ A/cm}^2$, $1 \times 10^6 \text{ A/cm}^2$, $2 \times 10^6 \text{ A/cm}^2$, $4 \times 10^6 \text{ A/cm}^2$. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. MPEP 2144.05 (I).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL A. WARTALOWICZ whose telephone number is (571)272-5957. The examiner can normally be reached on 8:30-6 M-Th and 8:30-5 on Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1793

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Paul Wartalowicz
December 30, 2009

/Steven Bos/
Primary Examiner, AU 1793